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RISING CORPORATE DEBT
PERIL OR PROMISE?

DISCUSSION PAPER
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IN BRIEF

RISING CORPORATE DEBT: PERIL OR PROMISE?

Since the 2008 financial crisis, global debt has continued to rise. Much of this increase is due to a surge in government borrowing, but corporate debt has risen over this period by nearly as much—a notable development. Corporate bond issuance has increased 2.5 times over the past decade, creating a broader and deeper market in many countries. This is welcome news, but there are also vulnerabilities. Key findings in this discussion paper include:

- Total debt (including household, nonfinancial corporate, and government debt) has grown by three-quarters since the financial crisis, from $97 trillion in 2007 to $169 trillion in the first half of 2017 in constant exchange rate terms. Government debt accounts for 43 percent of this increase; less noticed has been growth in nonfinancial corporate debt, which is nearly as big.
- Since the financial crisis, many large corporations around the world have shifted toward bond financing because commercial bank lending has been subdued. Today, nearly 20 percent of total global corporate debt is in the form of bonds, nearly double the share in 2007. Annual nonfinancial corporate bond issuance has increased 2.5 times, from $800 billion in 2007 to $2 trillion in 2017. The global value of corporate bonds outstanding has increased 2.7 times since 2007 to $11.7 trillion, doubling as a share of GDP.
- The long-awaited deepening of corporate bond markets and the diversification of corporate financing is good for the health of global financial markets. But there are risks. Noninvestment-grade bonds have almost quadrupled in size over the past decade, reaching $1.7 trillion in advanced economies. Between 2018 and 2022, a record $1.6 trillion to $2.1 trillion of corporate bonds will mature annually. Our analysis shows some of those issuers have fragile finances, and corporate defaults are already above the long-term average.
- Even at today's low interest rates, 20 to 25 percent of corporate bonds in Brazil, China, and India are at higher risk of default (issued by companies with an interest coverage ratio below 1.5). In our simulation of a 200-basis-point rise in interest rates, that share could increase to 30 to 40 percent.
- Corporate borrowers in advanced economies are in better financial health, with less than 10 percent of bonds (and below 5 percent in large European countries) issued by companies with weak finances. However, particular sectors and smaller companies could be vulnerable. In the United States, for instance, 18 percent of the value of bonds outstanding in the energy sector—$104 billion—is at higher risk of default.
- Will the growth of global corporate bond markets continue after the credit cycle turns and interest rates rise? While there are risks, there is also significant headroom for further growth. Banks that have focused on lending to large corporates may need to shift their focus, finding new customers in small and medium-sized companies and individuals. They will need to improve their underwriting and credit scoring capabilities, and increase cost efficiency. Investors have had a growing asset class to tap in recent years, but they need to carry out careful due diligence, particularly as the bull market ebbs; some will benefit from the potential rise in distressed debt sales. Policy makers and regulators should welcome the development of this market even as they encourage a shift toward electronic trading platforms, promote transparency in corporate financial reporting, and monitor potential systemic risks.

WHAT'S INSIDE

In brief
Page i

Rising corporate debt: peril or promise?
Page 1

1. Growth of global corporate bond markets
Page 6

2. A tidal wave of corporate bond refinancing is coming
Page 13

3. Navigating the risks that lie ahead
Page 23

Further reading
Page 27

Acknowledgments
Page 29

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Table
Offset
Period
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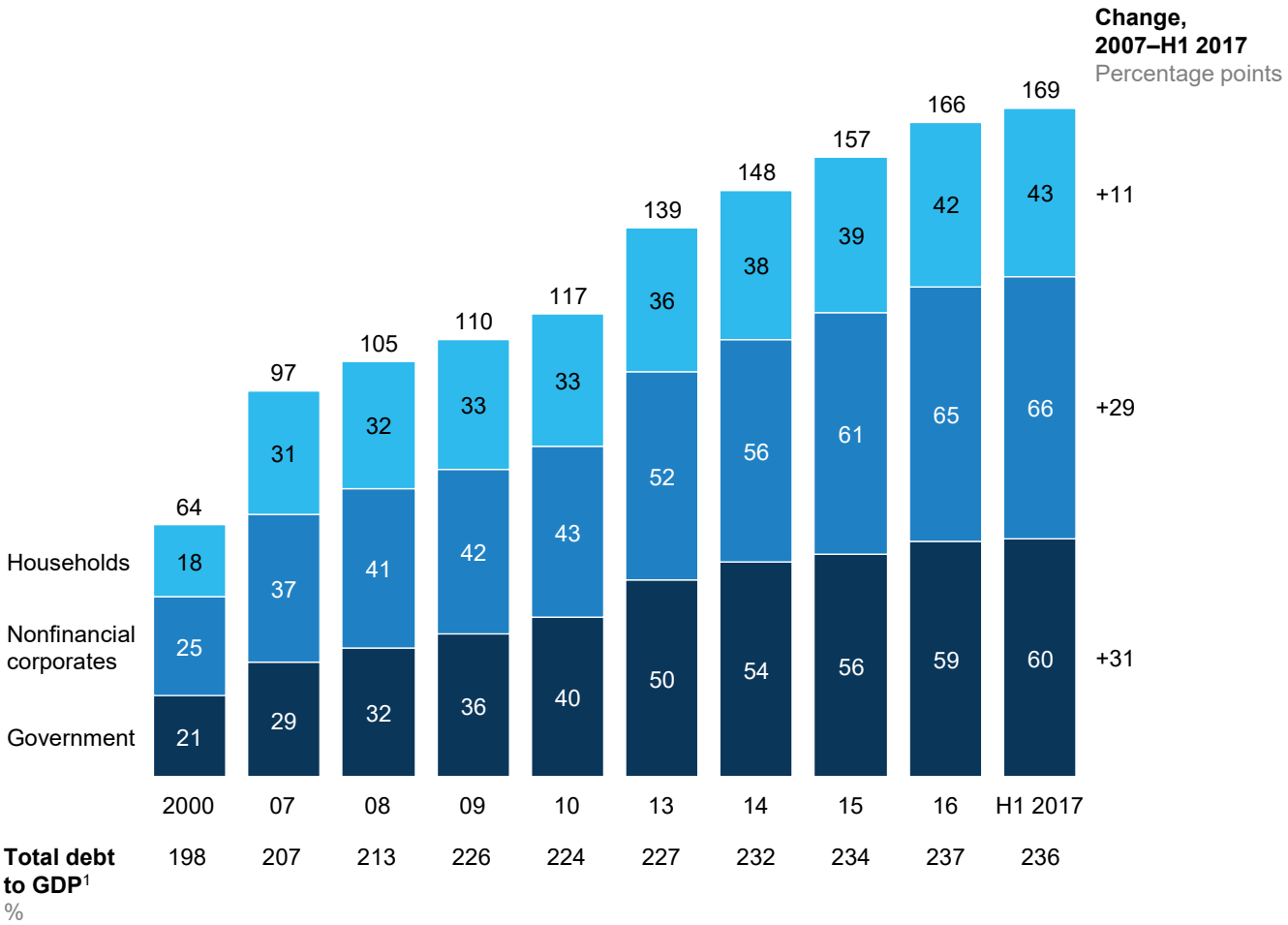
RISING CORPORATE DEBT: PERIL OR PROMISE?

After the 2008 financial crisis, many observers expected global debt levels to decline. However, while the household sector globally has reduced its debt relative to GDP, total debt, which includes household, nonfinancial corporate, and government debt, has continued to creep upward. Total debt reached $169 trillion by the middle of 2017, a 74 percent increase from where it stood on the eve of the crisis (Exhibit 1).[1]

Exhibit 1

Global debt has grown from $97 trillion to $169 trillion since the crisis but has been stable relative to world GDP since 2014.



1 Includes household, nonfinancial corporate, and government debt; excludes debt of the financial sector. Estimated bottom up using data for 43 countries from Bank for International Settlements (BIS) and data for eight countries from McKinsey's Country Debt Database.
NOTE: Figures may not sum to 100%, because of rounding.

SOURCE: BIS; McKinsey Country Debt Database; McKinsey Global Institute analysis

[1] This is the latest in MGI's ongoing series on global debt. See the previous installment, *Debt and (not much) deleveraging*, McKinsey Global Institute, February 2015.

Relative to world GDP, total global debt appears less worrisome: it increased from 207 percent of global GDP in 2007 to 232 percent in 2014 and has been flat ever since. However, what matters more than the overall level of debt is the composition of its growth and the creditworthiness of borrowers. Forty-three percent of the total increase was due to the surge in government borrowing after the crisis, from $29 trillion in 2007 to $60 trillion in the middle of 2017, as advanced economies fell into recession. A less noticed change in the global debt landscape has been growth in the debt of nonfinancial corporations.[2] Global nonfinancial corporate debt, including bonds and loans, more than doubled over the past decade, growing by $37 trillion to reach $66 trillion in mid-2017. This growth was nearly as much as the increase in government debt of $31 trillion over this period.

In a departure from the past, most of the growth in corporate debt has come from developing countries, in particular China. Companies in advanced economies accounted for just 34 percent or $9.9 trillion of the growth in global corporate debt since 2007, while developing countries accounted for 66 percent or $19.2 trillion. Since 2007, China's corporate debt has increased by $15 trillion, or more than half of global corporate debt growth. As a share of GDP, China's corporate debt rose from 97 percent of GDP in 2007 to 163 percent in 2017, one of the highest corporate debt ratios in the world apart from small financial centers that attract offshore companies. The growth in corporate debt in China is mainly associated with a construction sector that increased its leverage as the housing market boomed. Today, 30 to 35 percent of corporate debt in China is associated with construction and real estate.

Although most developing countries still have less corporate debt relative to GDP than advanced economies, some outside China have also experienced significant growth in corporate debt; Chile, Peru, the Philippines, Turkey, and Vietnam stand out (Exhibit 2). Another notable feature of corporate debt in developing economies is that a large share is denominated in foreign currency. For instance, around half of corporate debt in Hungary, Indonesia, and Turkey is denominated in US dollars and other foreign currencies.[3] Both rapid growth in the level of corporate debt and exposure to exchange rate fluctuations make corporate sectors in developing countries particularly vulnerable to economic shocks.

In advanced economies, corporate debt has grown in some countries but declined in others. The largest increases have been in Europe, particularly in Belgium, Finland, France, and Ireland; corporate debt in Canada has grown by a similar magnitude relative to GDP.[4] Countries with declining corporate debt relative to GDP include New Zealand, Spain, and the United Kingdom.

A relatively new feature of the debt landscape in recent years has been a shift in corporate borrowing from loans to bonds. Given the growing pressure on banks to meet new capital and liquidity standards, global nonfinancial corporate loans outstanding have been growing by only 3 percent annually on average since 2007 to stand at around $55 trillion in 2017. However, the share of global corporate debt in the form of bonds has nearly doubled, and the value of corporate bonds outstanding has grown 2.7 times since 2007. This is a positive trend, leading to a diversification of corporate financing. However, we also find risks.

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2 In this paper we use the terms "nonfinancial corporate debt" and "corporate debt" interchangeably. We exclude debt issued by financial institutions throughout this paper.

3 In Mexico, 72 percent of corporate debt is denominated in foreign currencies, but this mainly reflects borrowing by large companies whose revenue is in US dollars, thus removing currency risk.

4 There has also been strong growth in debt issued by companies that have moved to financial centers such as Luxembourg and Hong Kong. Ireland's high corporate debt also largely reflects the fact that many foreign companies have set up operations in Dublin and raise debt there.

For this research, we have assembled new data on the nonfinancial corporate bond market, including its size, its growth, and the composition of borrowers (see Box 1, "Methodology and data sources on corporate bonds"). We obtained data on the financial statements of bond issuers to assess the financial stability or fragility of issuers, which is particularly important given that a record amount of corporate bonds will come due in the next five years, a period during which interest rates are expected to be rising.

This discussion paper is organized as follows. In the first section, we assess growth in the global corporate bond market and shifts in the credit quality of issuers. In the second section, we look at the amount of bonds maturing in the next five years and potential risks. In the last section, we discuss the sustainability of the market's growth and explore implications for banks, investors, and policy makers.

Box 1. Methodology and data sources on corporate bonds

We assess growth in nonfinancial corporate bond markets on three dimensions: (1) the value of bonds issued; (2) the value of bonds maturing; and (3) the value of bonds outstanding. Our analysis is based on individual debt capital markets transactions (or deal-level data) from Dealogic as of December 2017. The scope of the analysis includes investment-grade and high-yield bonds, medium-term notes, and short-term debt (with an original maturity of less than 1.5 years). It excludes commercial paper, money-market instruments, preferred shares, reverse convertibles, convertible debentures, duplicate issues, and perpetual bonds that have no maturity date. Bonds issued in both local and foreign currency are included at their face value (principal amount).

The analysis includes all nonfinancial companies and financial units of nonfinancial corporates aimed exclusively at raising corporate funds (as opposed to those conducting financial activities for clients). It excludes all financial-sector companies such as commercial banks, insurance companies, investment companies, securities brokers, and asset management companies, and financial-sector subsidiaries of nonfinancial corporates working with clients (for example, commercial banks owned by automotive companies).

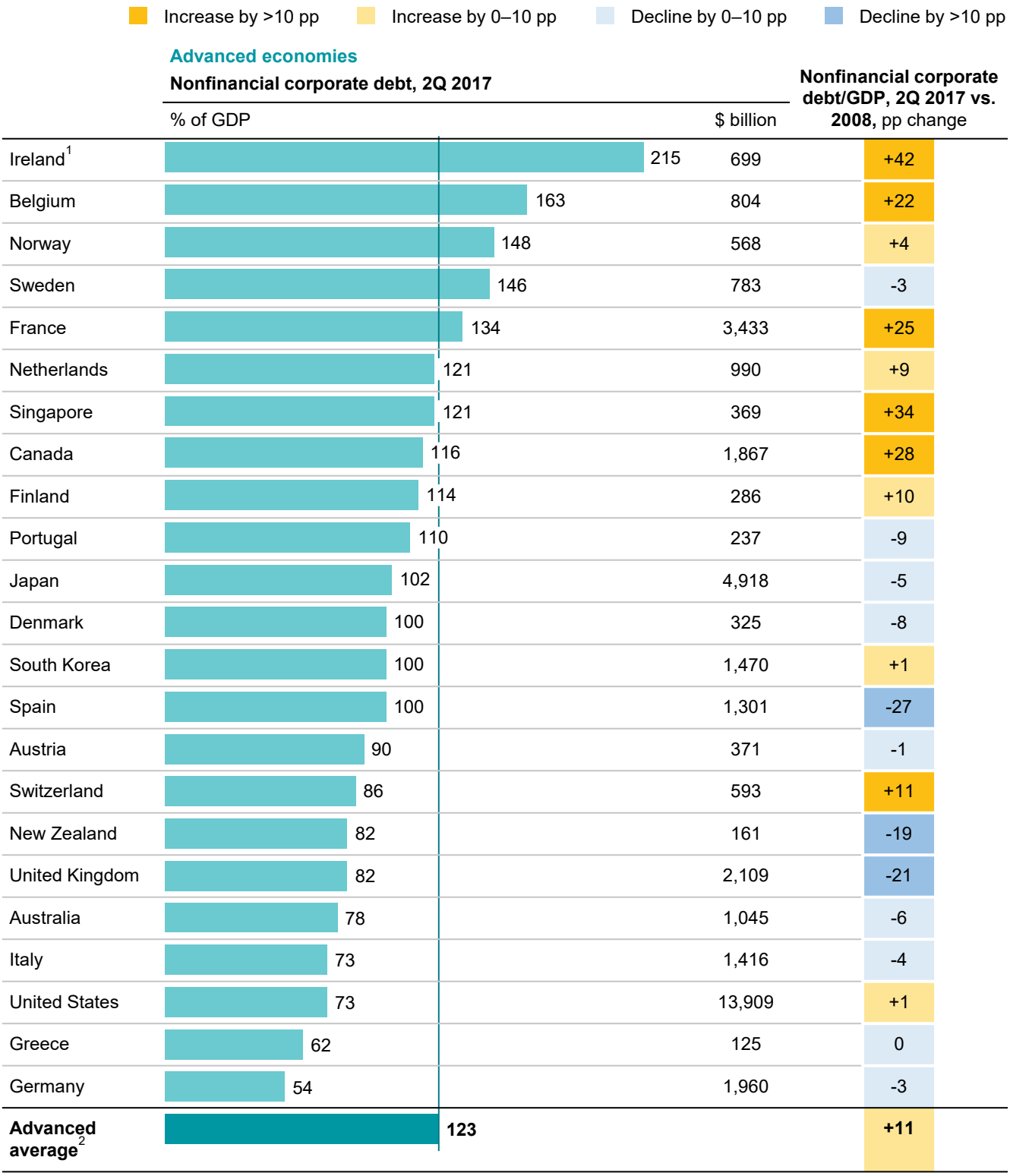
Bond nationality is based on the location of the headquarters of the parent company of the company issuing bonds, except for private-equity firms. Portfolio companies of private-equity firms and similar investment fund companies are assumed to maintain their own nationality rather than the nationality of the parent entity.

We have selected a sample of 44 countries, including both advanced and developing economies, based on the size of their 2016 nominal GDP and corporate bonds outstanding. Advanced economies included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong (China), Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Singapore, South Korea, Spain, Sweden, Switzerland, the United Kingdom, and the United States. Developing economies included are Argentina, Brazil, Chile, China, Colombia, the Czech Republic, India, Indonesia, Israel, Kazakhstan, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, South Africa, Thailand, and the United Arab Emirates.

Exhibit 2

Corporate debt has grown in many countries (1 of 2).

Nonfinancial corporate debt includes loans, bonds, and other debt securities


Increase by >10 pp
Increase by 0–10 pp
Decline by 0–10 pp
Decline by >10 pp
Advanced economies
Nonfinancial corporate debt, 2Q 2017
% of GDP
$ billion
Nonfinancial corporate debt/GDP, 2Q 2017 vs. 2008, pp change
Ireland[1] 215 699 +42
Belgium 163 804 +22
Norway 148 568 +4
Sweden 146 783 -3
France 134 3,433 +25
Netherlands 121 990 +9
Singapore 121 369 +34
Canada 116 1,867 +28
Finland 114 286 +10
Portugal 110 237 -9
Japan 102 4,918 -5
Denmark 100 325 -8
South Korea 100 1,470 +1
Spain 100 1,301 -27
Austria 90 371 -1
Switzerland 86 593 +11
New Zealand 82 161 -19
United Kingdom 82 2,109 -21
Australia 78 1,045 -6
Italy 73 1,416 -4
United States 73 13,909 +1
Greece 62 125 0
Germany 54 1,960 -3
Advanced average[2] 123 +11

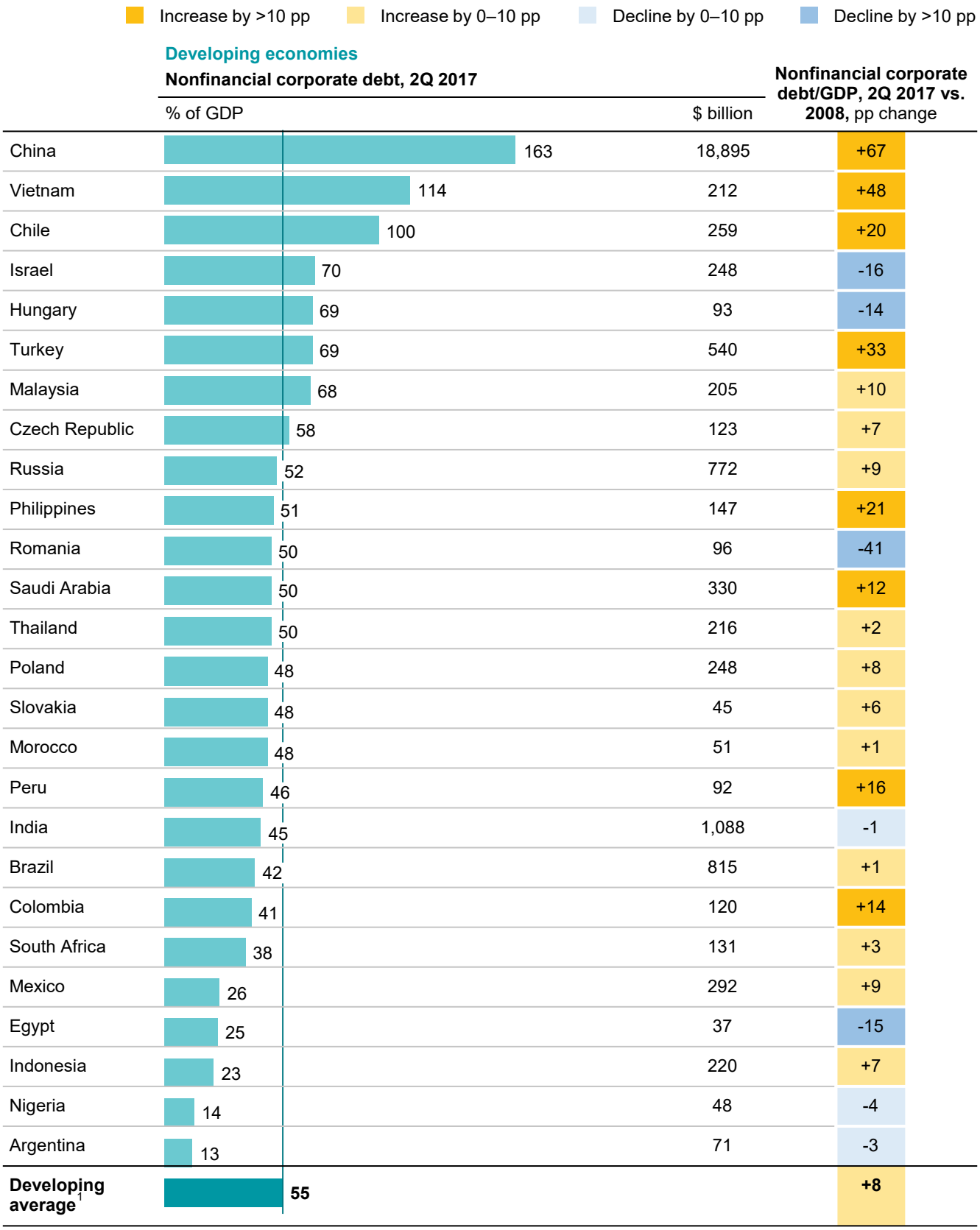
1 High nonfinancial corporate debt as a percentage of GDP due to large number of foreign companies.
2 Arithmetic average.

SOURCE: BIS; McKinsey Country Debt Database; McKinsey Global Institute analysis

Exhibit 2

Corporate debt has grown in many countries (2 of 2).

Nonfinancial corporate debt includes loans, bonds, and other debt securities


Increase by >10 pp
Increase by 0–10 pp
Decline by 0–10 pp
Decline by >10 pp
Developing economies
Nonfinancial corporate debt, 2Q 2017
% of GDP
$ billion
Nonfinancial corporate debt/GDP, 2Q 2017 vs. 2008, pp change
China 163 18,895 +67
Vietnam 114 212 +48
Chile 100 259 +20
Israel 70 248 -16
Hungary 69 93 -14
Turkey 69 540 +33
Malaysia 68 205 +10
Czech Republic 58 123 +7
Russia 52 772 +9
Philippines 51 147 +21
Romania 50 96 -41
Saudi Arabia 50 330 +12
Thailand 50 216 +2
Poland 48 248 +8
Slovakia 48 45 +6
Morocco 48 51 +1
Peru 46 92 +16
India 45 1,088 -1
Brazil 42 815 +1
Colombia 41 120 +14
South Africa 38 131 +3
Mexico 26 292 +9
Egypt 25 37 -15
Indonesia 23 220 +7
Nigeria 14 48 -4
Argentina 13 71 -3
Developing average[1] 55 +8

1 Arithmetic average.

SOURCE: BIS; McKinsey Country Debt Database; McKinsey Global Institute analysis

1. GROWTH OF GLOBAL CORPORATE BOND MARKETS

Since the 2008 financial crisis, banks have struggled to recover profitability and adapt to higher capital and liquidity requirements.[5] This has prompted a shift by companies toward bond financing relative to bank loans. Investors, for their part, have been eager to buy the new issues, attracted by yields somewhat higher than could be earned on sovereign bonds, with their ultra-low (and sometimes negative) yields. The growing investor demand for corporate bonds enabled many new companies to issue them for the first time. However, over the past decade there has also been a decline in credit quality in the corporate bond market, and risks have increased.

GLOBAL CORPORATE BONDS OUTSTANDING HAVE NEARLY TRIPLED, AND MATURITIES HAVE LENGTHENED

Today, 19 percent of global nonfinancial corporate debt is in the form of bonds, up from 10 percent in 2000 and 2007. A shift toward bond financing has been observed in all regions. In the United States, bonds accounted for 19 percent of all corporate debt financing in 2000; by 2016, that share had jumped to 34 percent. Western European and developing countries have been shifting toward the US model of a mixture of banks and debt markets providing funding to corporations, too. In Western Europe, the share of bond financing among companies almost doubled, from 9 to 17 percent, over the same period—although this was still half the share in the United States. In China, the share of bond financing in corporate debt rose from only 1 percent in 2000 to 11 percent in 2016, and in Brazil from 5 to 25 percent.[6]

As a result, nonfinancial corporate bond issuance and amounts outstanding have grown around the world. Annual issuance has increased 2.5 times over the past decade, from $800 billion in 2007 to $2 trillion in 2017. Companies in the United States still lead the world in issuance with $860 billion issued in 2017; companies from Western Europe issued $421 billion of bonds in 2017.[7] In China, issuance jumped from $33 billion in 2007 to almost $357 billion in 2017. In other developing countries, issuance reached $164 billion in 2017, up from $85 billion in 2007.[8] As a result, the global value of corporate bonds outstanding has increased 2.7 times since 2007 to $11.7 trillion, doubling when measured relative to world GDP (Exhibit 3).

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5 *The phoenix rises: Remaking the bank for an ecosystem world*, McKinsey Global Banking Annual Review 2017, McKinsey & Company Global Banking Practice, October 2017.

6 We focus on corporate bonds rather than corporate loans because more data are available on individual borrowers and their riskiness, and because a record amount of bonds will come due in the next five years.

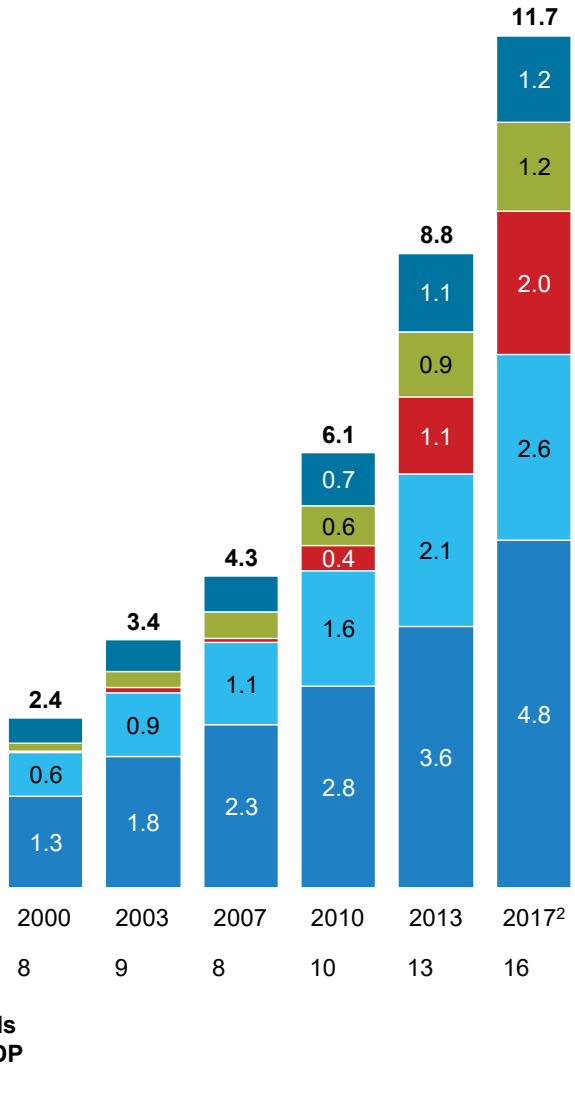
7 For more on US corporate bond issuance, see *Refunding risk and needs 2018–22: Investment-grade corporates—US*, Moody's Investors Service, January 30, 2018; and *Refunding risk and needs 2018–22: Speculative-grade corporations—US,* Moody's Investors Service, January 30, 2018. For more on European corporate bond markets, see *Remaking the corporate bond market: ICMA's 2nd study into the state and evolution of the European investment grade corporate bond secondary market*, International Capital Market Association, July 2016.

8 For more on developing country corporate bond markets, see Rohini Tendulkar, *Corporate bond markets: An emerging markets perspective*, Volume II, staff working paper of the IOSCO Research Department, September 25, 2015.

Exhibit 3

Nonfinancial corporate bonds outstanding have increased 2.7 times over the past decade to $11.7 trillion.

Global nonfinancial corporate bonds outstanding by region[1]
$ trillion, nominal exchange rate



	2007–17	
	Compound annual growth rate (CAGR) %	**Change** $ trillion
	+10.5	**+7.4**
Other advanced economies	+7.9	+0.6
Other developing economies	+14.0	+0.9
China	+39.9	+1.9
Western Europe	+8.6	+1.5
United States	+7.8	+2.6

Global nonfinancial corporate bonds outstanding/GDP %	2000	2003	2007	2010	2013	2017[2]
	8	9	8	10	13	16

1 Bond nationality is based on the location of the headquarters of the parent company of the company issuing bonds.
2 Data as of December 4, 2017.
NOTE: Figures may not sum to 100%, because of rounding.

SOURCE: Dealogic; McKinsey Global Institute analysis

As corporate bond markets have expanded and deepened, companies have been able to borrow at longer maturities. More than half of corporate bonds in most regions have maturities of more than five years.[9] Our analysis finds that 62 percent of corporate bonds in the United States issued between 2014 and 2017 had maturities of more than five years; in China the share was 54 percent, and in Western Europe 65 percent. Furthermore, 19 percent of bonds issued in the United States and Western Europe had a maturity of more than ten years. The lengthening of maturities of corporate bond issuance is a positive development, reflecting increasing market depth and liquidity, and growing confidence among investors in providing long-term financing.

Some companies have issued at far longer maturities—even 100 years. Blue-chip companies such as Walt Disney and Coca-Cola began issuing "century bonds" in the 1990s, but the number of such issuers has grown in recent years when interest rates have been ultra-low. In November 2017, Danish energy company Ørsted raised €500 million via a hybrid bond issue that doesn't mature for 1,000 years.

The expansion and deepening of corporate bond markets, and increased access to bond financing for companies around the world, are welcome developments. Corporate bond markets serve an important economic function in bringing together companies requiring capital to invest in, or expand, their businesses, and investors and savers looking to earn a stable income from their investments and savings. Bond markets provide an important alternative to bank lending and can enhance the stability of the financial system, mitigating some of the risks of banking crises on the economy. For many companies, bond markets provide a cheaper source of debt than bank loans. For investors, corporate bonds provide an attractive vehicle for earning income and are an alternative to equities. Corporate bond markets play a key role in facilitating economic growth, productivity, and employment.

RISKS HAVE INCREASED IN THE CORPORATE BOND BULL MARKET

While the expansion and deepening of global corporate bond markets is good news, there are also signs that the creditworthiness of borrowers has declined.[10] This could prompt more defaults in the years ahead as a record amount of bonds come due and as future borrowing costs rise.

The average credit quality of blue-chip borrowers has declined

The bond market is divided between investment-grade borrowers, or companies with the highest credit quality, and lower-rated noninvestment-grade borrowers, who issue high-yield bonds or "junk bonds." Over the past ten years, however, even the average quality of investment-grade issuers has declined.

In the United States, almost 40 percent of all nonfinancial corporate bonds are now rated BBB, just a few steps above noninvestment grade, up from 22 percent in 1990 and 31 percent in 2000, according to Morgan Stanley. Overall, BBB-rated US nonfinancial corporate bonds outstanding total $1.9 trillion—almost twice the size of the high-yield bond market (Exhibit 4). Issuers are also more heavily indebted than before. The net leverage ratio for BBB issuers rose from 1.7 in 2000 to 2.9 in 2017, according to PIMCO.[11]

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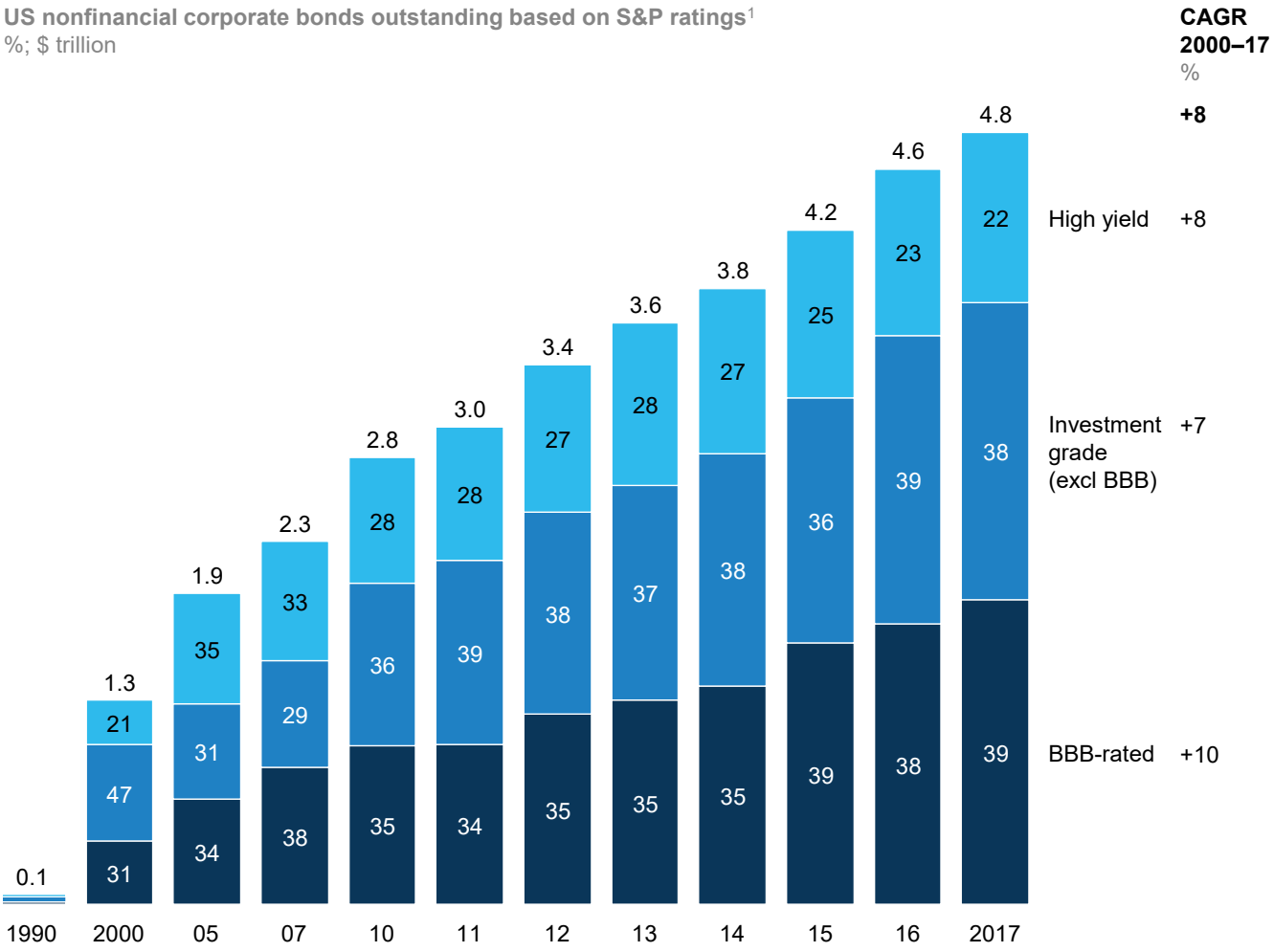
9 For a discussion of optimal debt maturity strategies, see R. Matthew Darst and Ehraz Refayet, *A collateral theory of endogenous debt maturity*, Finance and Economies Discussion Series working paper number 2017-057, Board of Governors of the Federal Reserve System, 2017; and Jaewon Choi, Dirk Hackbarth, and Josef Zechner, *Corporate debt maturity profiles*, August 28, 2017.

10 See "The riskiness of credit allocation: A source of financial vulnerability?" in *Global financial stability report April 2018: A bumpy road ahead?* IMF, April 2018.

11 Jelle Brons and Lillian Lin, *Investment grade credit: Be actively aware of BBB bonds*, PIMCO Viewpoints, January 2018. Net leverage is defined as total debt minus cash minus short-term investment/earnings before interest, taxes, depreciation, and amortization (EBITDA).

Exhibit 4

The share of BBB-rated bonds in US nonfinancial corporate bonds outstanding is almost 40 percent.



1 Shares from Morgan Stanley applied to Dealogic numbers.
NOTE: Figures may not sum to 100%, because of rounding.

SOURCE: Morgan Stanley; Dealogic; McKinsey Global Institute analysis

Growth has been particularly strong in speculative-grade corporate bonds

While the average credit quality of investment-grade borrowers has declined, issuance has been particularly strong in bonds that are below investment grade: speculative-grade or high-yield bonds.[12] As interest rates on sovereign bonds fell to historical lows, investors' appetite for bonds with higher yields (and higher risk) grew.[13] Globally, the value of corporate high-yield bonds outstanding increased from $500 billion in 2007 to $1.9 trillion in 2017.[14] The latter figure represents 29 percent of corporate bonds that have credit ratings. In 2017, 43 percent of bonds were not rated by the major agencies, typically because they were from smaller companies or were private placements (Exhibit 5).

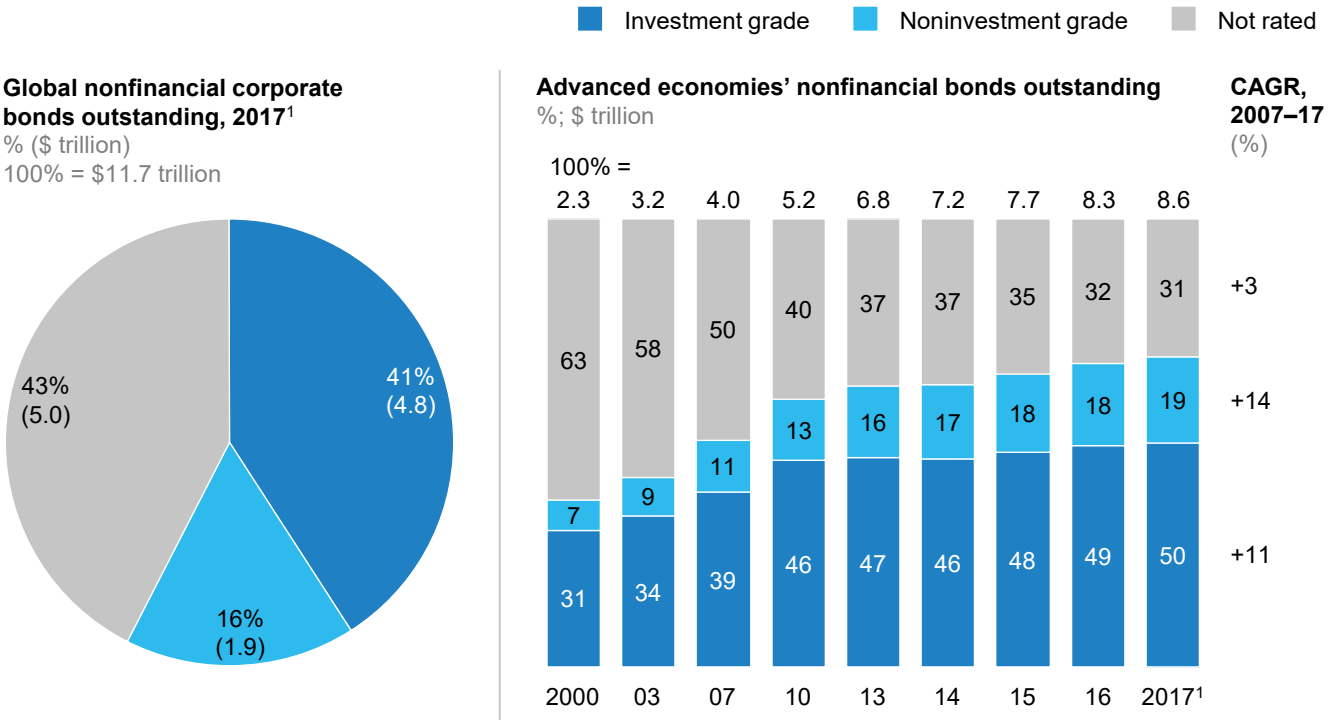
12 We use the terms "high yield," "noninvestment grade," and "speculative grade" interchangeably. We use Moody's Investors Service's credit ratings for the analysis of the rating of bonds outstanding and maturing annually; bonds with a rating of Baa3 and above are considered investment grade, and Ba1 and below are considered speculative grade or high yield.

13 See "Resilience in a time of high debt," *OECD Economic Outlook*, volume 2017, issue 2, OECD, 2017; and *Refunding risk and needs 2018–22: Speculative-grade corporations—US*, Moody's Investors Service, January 30, 2018.

14 At the same time, the "leveraged loan" market has also grown rapidly. These are syndicated loans for speculative-grade borrowers. According to Bank of America Merrill Lynch Research, the US leveraged loan market is nearly $1 trillion, double the size a decade ago and close to the size of the US high-yield bond market.

Exhibit 5

Noninvestment-grade bonds account for 16 percent of total bonds outstanding.


Investment grade
Noninvestment grade
Not rated
Global nonfinancial corporate bonds outstanding, 2017[1]
% ($ trillion)
100% = $11.7 trillion
41% (4.8)
16% (1.9)
43% (5.0)
Advanced economies' nonfinancial bonds outstanding
%; $ trillion
CAGR, 2007–17 (%)
100% =
2.3 3.2 4.0 5.2 6.8 7.2 7.7 8.3 8.6
63 58 50 40 37 37 35 32 31
7 9 11 13 16 17 18 18 19
31 34 39 46 47 46 48 49 50
+3
+14
+11
2000 03 07 10 13 14 15 16 2017[1]

1 Data as of December 4, 2017.
NOTE: Figures may not sum to 100%, because of rounding.

SOURCE: Dealogic; McKinsey Global Institute analysis

Noninvestment-grade bonds carry higher default risk, which increases the vulnerability of the corporate bond market.[15] In the coming years, a record amount of speculative-grade corporate bonds could need refinancing. In the United States, for instance, the share of maturing bonds that are high yield is expected to grow from 11 percent in 2017 to 27 percent in 2020. The absolute amount—at least $180 billion of high-yield bonds coming due in 2020—will be almost three times the amount in 2017. If current high-yield issuance trends continue, that share will rise even more. Similarly, in other advanced economies, the share of bonds maturing that are high yield is expected to increase from 10 percent in 2017 to 14 percent in 2020 and to as much as 17 percent by 2022 based on the rating of bonds already issued.

The amount of high-yield bonds in need of refinancing could create problems in some sectors and among weak performers. US retailers, for instance, are burdened with a very large amount of high-yield debt coming due over the next five years, and many stores face declining sales as shoppers shift to e-commerce.[16] As energy prices have fallen, the credit ratings of many energy companies have also been downgraded. Investor wariness about refinancing high-yield bonds in the coming years could force bankruptcies.

15 *Global financial stability report April 2018: A bumpy road ahead?* IMF, April 2018.
16 Matt Townsend et al., "America's 'retail apocalypse' is really just beginning," Bloomberg, November 8, 2017.

In addition, the new US corporate tax law limits interest deductibility on corporate debt. For highly leveraged companies, this will increase the effective cost of interest payments and may reduce profits. Although the overall lower corporate tax rate will increase profits, Moody's Investors Service estimates that the new law will negatively affect up to one-quarter of highly leveraged companies.[17] In some sectors, a much higher share of corporates will be worse off, including nearly half of highly leveraged companies in telecommunications and semiconductors, and nearly 40 percent of wholesale distributors. The tax change will hurt many companies owned by private-equity firms, since buyouts typically increase company leverage to higher levels than the interest-deductibility cap.[18] Moody's estimates that around one-third of leveraged buyouts will be worse off under the new tax law.[19]

Bond issuance by companies in China and other developing economies has soared

Another corner of the global corporate bond market that investors have turned to for higher yields is developing markets. The value of China's nonfinancial corporate bonds outstanding increased from $69 billion in 2007 to $2 trillion by the end of 2017, making China one of the largest bond markets in the world. In developing countries other than China, corporate bonds outstanding have also grown, although at a more measured pace of 14 percent a year, from $313 billion in 2007 to $1.2 trillion in 2017 (Exhibit 6). Growth has been particularly strong in Brazil, Chile, Mexico, and Russia.

While in China 95 percent of corporate bonds outstanding are denominated in the local currency, in other developing countries that is not the case. Historically, nearly all companies in developing economies issued bonds in foreign currencies because investors would not take the risk of buying bonds in local currencies. However, over the past decade, larger local-currency bond markets have developed. Still, roughly two-thirds of corporate bonds in developing economies maturing annually are denominated in US dollars and other foreign currencies.[20] This creates additional risk, because debt service costs will soar if the local currency depreciates (and the company does not have revenue streams in the foreign currency).

The deepening of corporate bond markets in developing countries provides an important source of financing for investment and growing firms. However, these bonds typically have higher risk associated with them due to higher country risk, often weaker governance and management, and less transparency on corporate financial performance. Reflecting these higher risks, cross-border investment flows into these bonds demonstrate significant volatility. In April 2018, increased US bond yields and a stronger dollar prompted an outflow of portfolio investment from developing economies.[21] The large amount issued in foreign currencies adds another layer of risk for some companies; if the local exchange rate depreciates and the company's revenue is in local currency, the cost of servicing foreign currency debt rises, increasing the likelihood of default.[22] As we will discuss, many corporate issuers in developing economies already have fragile finances relative to the size of their current debt-service payments.

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17 *Moody's: US government's tax proposals would benefit all but highly leveraged companies*, Global Credit Research, Moody's Investors Service, December 12, 2017.

18 The cap on interest deductibility is 30 percent of a company's EBITDA in the period to 2021, and an even more stringent 30 percent of EBIT after 2021.

19 *Moody's: US government's tax proposals would benefit all but highly leveraged companies*, Moody's Investors Service, December 12, 21017.

20 *Debt in frontier markets under the microscope*, Institute of International Finance, February 12, 2018.

21 *IIF flows alert: Sharp pullback in EM flows*, Institute of International Finance, April 25, 2018.

22 See, for instance, Branimir Gruić, Masazumi Hattori, and Hyun Song Shin, "Recent changes in global credit intermediation and potential risks," *BIS Quarterly Review*, Bank for International Settlements, September 2014.

Exhibit 6

Corporate bond markets in many developing countries have grown rapidly over the past decade.

Increase by <5 pp | Increase by 5–10 pp | Increase by >10 pp

	Nonfinancial corporate bonds outstanding, 2017		Nonfinancial corporate bonds/GDP, 2017 vs. 2008	Share of bonds in nonfinancial corporate debt, 2017[1]	Nonfinancial corporate bonds maturing in 2018–22[2]	Share of foreign currency denominated nonfinancial corporate bonds maturing in 2018–22[2]
	% of GDP	$ billion	pp change	%	$ billion	%
Chile	22	60	+13	23	15	74
Mexico	21	239	+15	82	130	82
Malaysia	18	58	+3	28	39	35
China	16	1,981	+13	10	1,684	15
Russia	13	198	+9	26	103	57
Thailand	12	55	+4	25	44	9
Brazil	11	217	+8	27	157	60
Colombia	7	22	+7	19	13	76
Peru	7	14	+6	15	5	94
South Africa	6	19	+3	15	14	89
Philippines	5	17	+3	11	9	28
India	4	113	+3	10	63	43
Czech Republic	4	7	+3	6	5	82
Indonesia	3	32	+1	15	19	59
Argentina	3	17	+2	21	11	81
Poland	1	5	+1	2	4	89

1 Nonfinancial corporate debt as of 2Q 2017.
2 Based on December 2017 data.

SOURCE: BIS; McKinsey Country Debt database, McKinsey Global Institute analysis

2. A TIDAL WAVE OF CORPORATE BOND REFINANCING IS COMING

As the global corporate bond market has grown, so has the value of bonds that will mature each year. As a bond matures, companies have two choices: to repay the principal amount borrowed, or to issue a new bond to replace the maturing one. Historically, companies issued long-term bonds for project finance and repaid the debt once due. Today, however, most borrowers seek to refinance maturing bonds by issuing new ones.

From 2018 to 2022, a record amount of bonds—between $1.6 trillion and $2.1 trillion annually—will mature. Globally, a total of $7.9 trillion of bonds will come due during those five years, based on bonds already issued. However, some bonds have maturities of less than five years and may still be issued and come due during that period. If current issuance trends continue, then as much as $10 trillion of bonds will come due over the next five years (Exhibit 7). At least $3 trillion of this total will be from US corporations, $1.7 trillion from Chinese companies, and $1.7 trillion from Western European companies.

Rising interest rates could make it more difficult for many borrowers to refinance their debt. Corporate default rates are already above the 30-year average, and they could rise further as higher interest rates make debt burdens unsustainable. In this section, we analyze the ability of corporate issuers to repay their debt. We find that some companies already are only barely covering their debt service costs, and that the share of such companies will rise with higher interest rates.

CORPORATE PROFITS ARE HIGH BUT DECLINING, AND DEFAULTS ARE RISING

Corporate profits are at or near historical highs after three decades of growth. Earnings before interest and taxes of all global corporations more than tripled in real terms between 1980 and 2013. Globally, corporations made a combined profit of $7.2 trillion, or 9.8 percent of GDP, in 2013—a record.[23] This has given most companies ample financial capacity to finance their growing leverage.

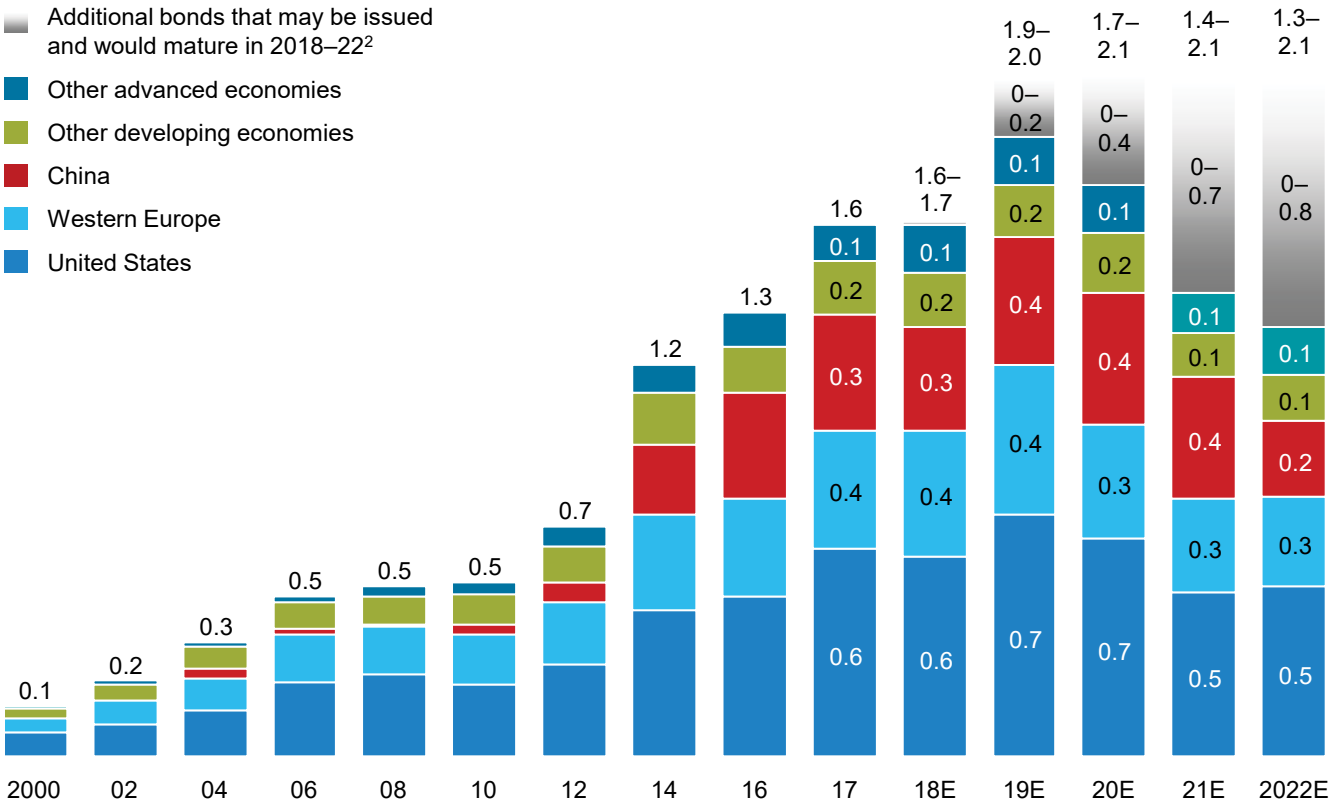
However, profits are spread unevenly among corporations and have declined somewhat from their highs. In the United States, profits peaked at 9.3 percent of GDP in 2013 but have fallen by a full percentage point since then (Exhibit 8). This decline partly reflects lower energy prices, but other factors also play a role. MGI research suggests that the global profit outlook could come under pressure as competition intensifies when new players, especially from developing countries, and entrepreneurial tech-enabled companies come into the frame. Due to growing competition in a variety of industries, the corporate profit pool could decrease from 10 percent of global GDP to around 8 percent by 2025.[24]

[23] *Playing to win: The global competition for corporate profits*, McKinsey Global Institute, September 2015.
[24] Ibid.

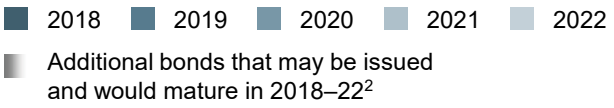
Exhibit 7

Between $1.6 trillion and $2.1 trillion of corporate bonds will mature annually from 2018 to 2022.

Global nonfinancial corporate bonds maturing annually[1]
$ trillion


Additional bonds that may be issued and would mature in 2018–22[2]
Other advanced economies
Other developing economies
China
Western Europe
United States
2000 02 04 06 08 10 12 14 16 17 18E 19E 20E 21E 2022E
0.1 0.2 0.3 0.5 0.5 0.5 0.7 1.2 1.3 1.6 1.6–1.7 1.9–2.0 1.7–2.1 1.4–2.1 1.3–2.1

Nonfiancial corporate bonds maturing in 2018–22[1]
$ trillion



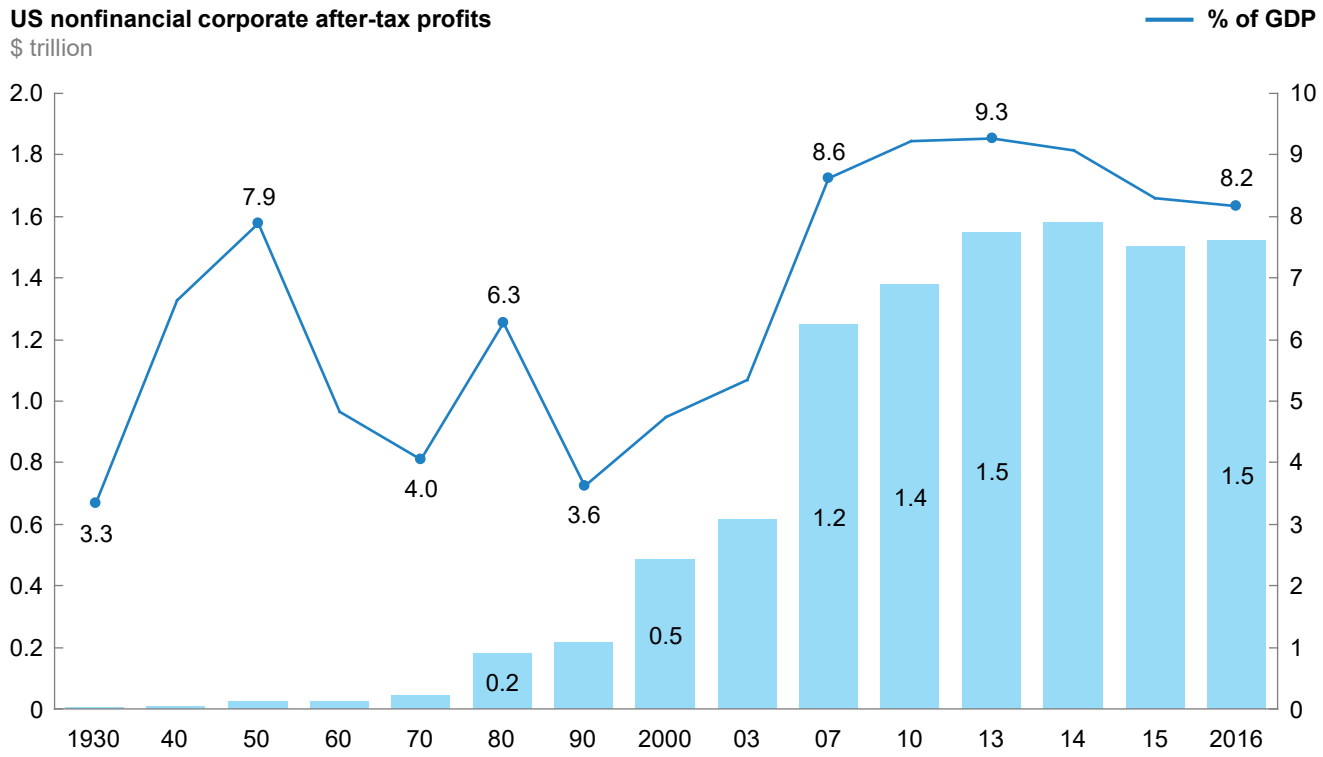
	Nonfinancial corporate bonds outstanding, December 2017[1] $ trillion	Share of nonfinancial corporate bonds outstanding as of December 2017, maturing over the next 5 years[1] %
United States	4.8	62
China	2.0	85
Western Europe	2.6	66
Other advanced economies	1.2	65
Other developing economies	1.2	59

1 Data as of December 4, 2017.
2 Bonds of shorter maturities (less than 5 years) may be issued in coming years and would add to the amount maturing each year. We base our projection of the size of these issuances on the historical trend from 2014 to 2017 for each maturity.
NOTE: Figures may not sum to 100%, because of rounding.

SOURCE: Dealogic; McKinsey Global Institute analysis

Exhibit 8

US nonfinancial corporate profits have increased since 1990 and have been near an all-time high since 2013.



SOURCE: Bureau of Economic Analysis; McKinsey Global Institute analysis

Meanwhile, the global corporate default rate on financial obligations (calculated by S&P Global Ratings as the percentage of issuers that defaulted on one or more financial obligations) rose to 2.1 percent in 2016, above the long-term average of 1.5 percent since 1981 (Exhibit 9).[25] The United States accounted for the majority of defaults in 2016—65 percent of the global total, largely reflecting difficulties faced by the energy and natural resources sector. Globally in the energy and natural resources sector, the corporate default rate increased to 13 percent in 2016, compared with a weighted average of 3 percent between 1981 and 2016. Developing economies accounted for 20 percent of global defaults in 2016. The prospect of rising interest rates for the first time since the global financial crisis of 2008 may put more corporate bond borrowers at higher risk.[26]

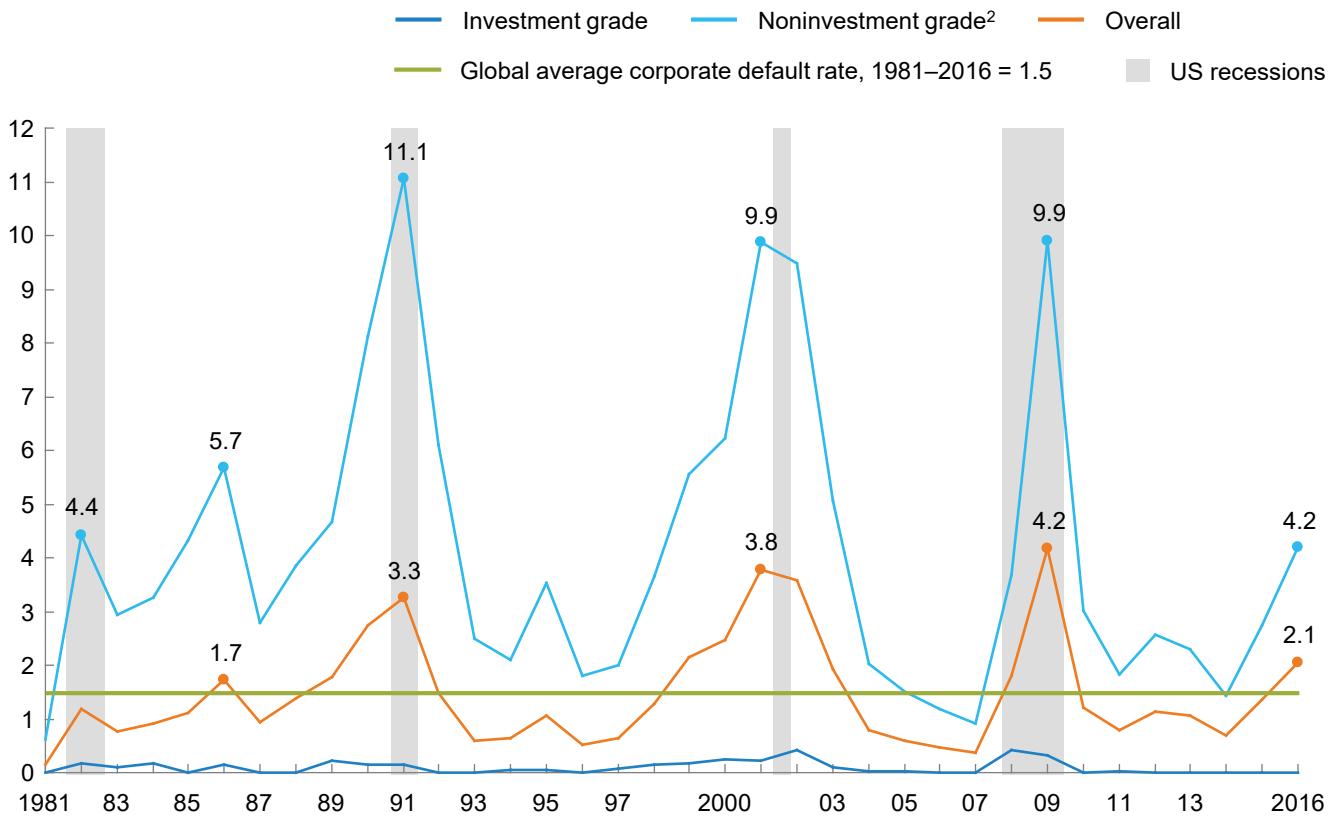
[25] *Default, transition, and recovery: 2016 annual global corporate default study and rating transitions*, S&P Global Ratings, April 13, 2017.

[26] Patricio Valenzuela, "Rollover risk and credit spreads: Evidence from international corporate bonds," *Review of Finance*, volume 20, issue 2, March 2016; and Xue-Zhong He, Eva Lütkebohmert, and Yajun Xiao, "Rollover risk and credit risk under time-varying margin," *Quantitative Finance,* volume 17, issue 3, March 2017.

Exhibit 9

Corporate default rates have risen in recent years and are now above the 30-year average.

Global corporate default rate (share of issuers that default)[1]
%



1 Includes financial and nonfinancial corporations.
2 Noninvestment grade is defined as a rating of BB+ and lower based on S&P rating.

SOURCE: S&P Global Ratings; McKinsey Global Institute analysis

UP TO 25 PERCENT OF CORPORATE BONDS IN DEVELOPING ECONOMIES ARE AT RISK OF DEFAULT

To assess potential risks in the corporate bond market as record numbers of bonds mature and need to be refinanced, we calculated the interest coverage ratio, a metric of corporate financial performance, for all bond issuers in a sample of countries (see Box 2, "Methodology for assessing potential corporate bond defaults"). Even at today's historically low interest rates, there are pockets of concern in some sectors of advanced economies and more broadly based concern in developing countries. We find that the share of bonds potentially at risk of default rises significantly in a scenario in which interest rates rise.

The share of bonds outstanding issued by companies in major advanced economies with an interest coverage ratio below 1.5 is less than 10 percent. In France, Germany, and the United Kingdom, only 2 to 4 percent of bonds outstanding are from companies with an interest coverage ratio of less than 1.5. In the United States and Canada, the share is a bit higher but still moderate, at 6 and 7 percent, respectively. But in the large developing economies we examine—Brazil, China, and India—around 20 to 25 percent of corporate bonds are from issuers with an interest coverage ratio below 1.5, putting them at higher risk of default (Exhibit 10).

Box 2. Methodology for assessing potential corporate bond defaults

To determine companies' potential inability to service their debt in the future, we calculated the interest coverage ratio for individual companies that have issued bonds.[1] This metric is defined as the company's earnings before interest, taxes, depreciation, and amortization (EBITDA) divided by annual interest expenses on its debt. The higher this ratio, the more able a company is to withstand financial shocks and still service its debt. For many companies, this ratio can be 3, 4, or much higher. A ratio below 1 indicates that a company's EBITDA is not sufficient to repay interest; if the company has not defaulted on the bond, it is borrowing more or selling assets.

We employ a commonly used threshold of 1.5 to identify companies at potential risk of default. At this threshold, companies are currently able to finance their interest expenses with EBITDA, but they have little scope for profits to fall. If the interest coverage ratio is below this threshold, the company has a higher probability of default. We refer to the bonds of companies whose ratio is below 1.5 as "at higher risk of default." Although we have opted to use this simple definition in this paper, we note that default is not the only option for a company that cannot service its debt. Alternatives include selling assets, issuing bond-exchange offers, and other restructuring measures.

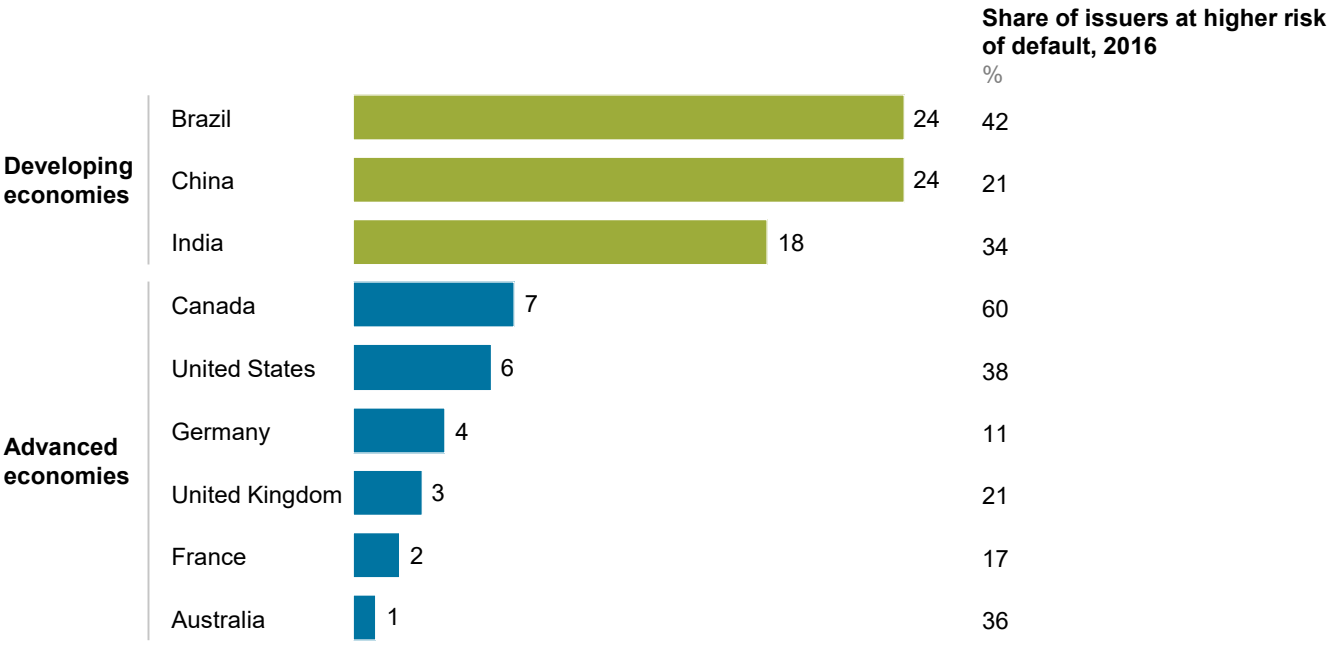
Our analysis is based on Capital IQ company-level data as of December 2017. The analysis includes nonfinancial companies for which both EBITDA and interest expense data are available; it covers 216,571 companies in our sample set of countries. The interest coverage ratio is calculated on total liabilities (including both loans and bonds) because standard corporate reporting does not contain a breakdown of interest expenses on loans versus bonds. For this analysis, we have selected a sample of advanced and developing countries based on the size of their corporate bonds outstanding and the amount of corporate debt. These countries are Australia, Brazil, Canada, China, France, Germany, India, the United Kingdom, and the United States.

[1] An alternative measure of calculating the level of risk associated with corporate bonds is net debt to EBITDA. We calculated the ratio for Brazil, and the results are aligned with the results of interest coverage ratio analysis.

Exhibit 10

A significant share of corporate bonds outstanding in large developing economies is from issuers at higher risk of default.

Share of bonds outstanding of nonfinancial corporates with EBITDA/interest expense ratio below 1.5, 2016[1]
%



1 Earnings before interest, taxes, depreciation, and amortization.

SOURCE: Capital IQ; McKinsey Global Institute analysis

In most countries, default risk is concentrated in smaller issuers. We see this from the fact that the share of companies with a low interest coverage ratio is higher than the share of the value of bonds outstanding. The one exception is China, where the share of bonds at higher risk of default (24 percent) is similar to the share of companies at higher risk of default (21 percent). This may also explain why maturities on debt issued by Chinese corporations are shorter than for debt issued by companies in advanced economies, as investors concerned about the financial health of companies extend only shorter-term credit.

However, even in advanced economies, we find that the share of bonds from companies with low interest coverage ratios is much higher in some sectors than the overall average (Exhibit 11). In the United States, for instance, companies whose interest coverage ratio is below the 1.5 threshold account for 18 percent of the value of bonds outstanding in the energy sector, or $104 billion. The risk of default in the sector mainly relates to the large number of smaller companies involved in the production of natural gas and oil from shale reserves that have struggled with low natural gas prices and the sharp decline in oil prices. Many have issued high-yield bonds, and some of these players are already seeking relief.[27] For instance, the medium-sized oil company Midstates Petroleum announced the sale of its Anadarko Basin producing properties in Texas and Oklahoma because of pressure from distressed debt.[28] This situation may continue given the introduction of a 25 percent tariff on imported steel and a 10 percent tariff on imported aluminum in March 2018; both metals are widely used by companies in the energy sector.[29]

In China, one-third of bonds issued by industrial companies (worth $250 billion) and 28 percent of bonds issued by real estate companies ($104 billion) are from issuers with an interest coverage ratio below the 1.5 threshold. Chinese real estate companies have borrowed large amounts over the past few years to finance a construction boom, and concern that China is now experiencing a housing bubble is rising. Although authorities have taken a range of measures to cool the housing market and reduce the risk, for instance tightening mortgage and reselling conditions for home buyers, bond defaults in the sector have risen, and there is a risk of more as the construction sector cools further. For instance, Wuyang Construction Group Company, a leading builder in the eastern province of Zhejiang, defaulted on two bond payments worth $209 million in August 2017.[30] The consumer goods and retail sectors also have a high share of bonds from companies with interest coverage ratios below 1.5.

In Brazil, several sectors, including consumer goods, energy, and industrial companies, have a large share of bonds issued by companies below the threshold. One-quarter of all corporate bonds at higher risk of default, valued at $13 billion, are in the industrial sector. These companies have been facing declining profits mainly because they have had to leave capacity and labor idle in factories as a consequence of weak consumer demand reflecting rising unemployment, high inflation and interest rates, and uncertainty. Although consumer demand is recovering somewhat, industrial companies are still not upping investment as they grapple with high debt levels.[31] Because many large Brazilian companies are majority state-owned, they are unlikely to default given that their obligations are implicitly guaranteed by the government. However, high risks associated with large state-owned companies

[27] High-yield US energy debt supply approached the $7 billion mark in September 2017 alone, accounting for 31 percent of total issuance, according to Bloomberg. See Molly Smith, "Energy debt sells like it's 2014 even with crude oil at $50," Bloomberg Markets, October 5, 2017.

[28] *Midstates Petroleum announces agreement for sale of Anadarko Basin producing properties for $58 million*, BusinessWire, April 4, 2018.

[29] Erwin Seba and Timothy Gardner, "Update 3—U.S. energy industry slams Trump's 'job-killing' steel tariff," Reuters, March 1, 2018.

[30] "China's latest bond default is a cautionary tale for investors," Bloomberg News, September 10, 2017.

[31] Bruno Federowski, "Brazil consumers drive recovery as investment lags," Reuters, August 31, 2017. For a general discussion of the implications for consumer goods companies of Brazil's challenging economic conditions, see, for instance, *Meet the new Brazilian consumer*, McKinsey & Company, June 2016.

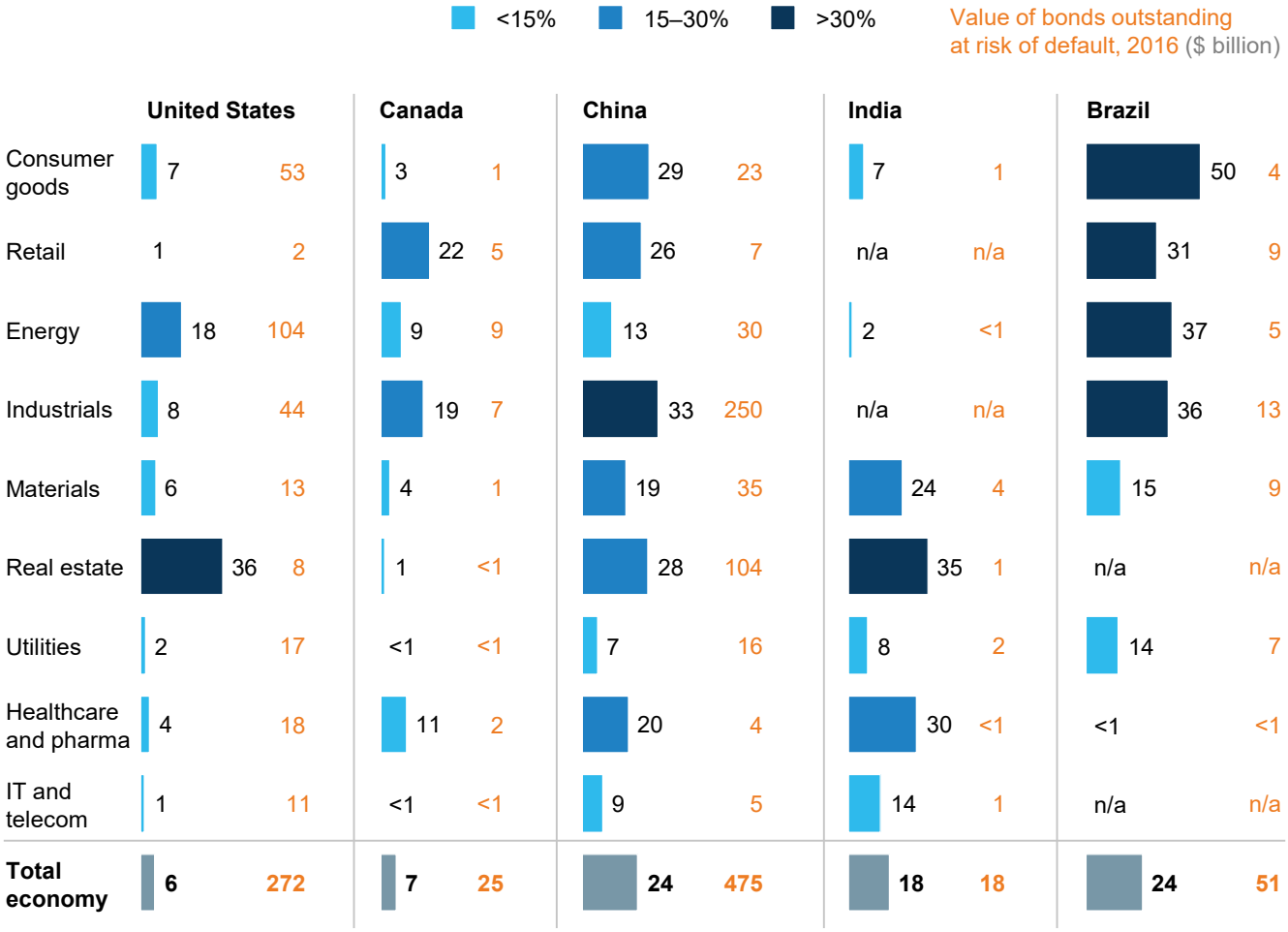
increase the vulnerability of the economy and might put additional pressure on government finances. GDP in Brazil grew at a compound annual rate of only 2.7 percent between 2000 and 2015, one of the weakest showings in Latin America, compared with 4.5 percent in the Andean region and 4 percent in Central America.[32]

In India, the real estate, healthcare and pharmaceuticals, and materials sectors represent a large share of bonds from companies with interest coverage ratios below the threshold. In addition, half of telecom companies have interest coverage below the threshold, although only 14 percent of bonds are from issuers with weak financial performance. Industry profits are under intense pressure. In November 2017, Moody's predicted that India would be the only country in Asia whose telecom sector would continue to experience declining revenue, reflecting unprecedented price competition caused by the September 2016 entrance to the market of Reliance Jio Infocomm, which offered customers a lifetime of free voice calls and months of free data.[33]

Exhibit 11

Even in advanced economies, some sectors have a high share of bonds at risk of default.

Share of bonds outstanding of nonfinancial corporates with EBITDA/interest expense ratio below 1.5, 2016[1]
%



	United States		Canada		China		India		Brazil	
Consumer goods	7	53	3	1	29	23	7	1	50	4
Retail	1	2	22	5	26	7	n/a	n/a	31	9
Energy	18	104	9	9	13	30	2	<1	37	5
Industrials	8	44	19	7	33	250	n/a	n/a	36	13
Materials	6	13	4	1	19	35	24	4	15	9
Real estate	36	8	1	<1	28	104	35	1	n/a	n/a
Utilities	2	17	<1	<1	7	16	8	2	14	7
Healthcare and pharma	4	18	11	2	20	4	30	<1	<1	<1
IT and telecom	1	11	<1	<1	9	5	14	1	n/a	n/a
Total economy	**6**	**272**	**7**	**25**	**24**	**475**	**18**	**18**	**24**	**51**

1 Companies for which industry classification is not available are excluded from the breakdown but included in total economy.
NOTE: n/a means data are not available for companies in the industry or the sample of companies in the industry is not representative. Figures may not sum to 100%, because of rounding.

SOURCE: Capital IQ; Dealogic; McKinsey Global Institute analysis

[32] For an overview of Latin America's economies in 2017, see *Where will Latin America's growth come from?* McKinsey Global Institute discussion paper, April 2017.

[33] See, for instance, "Indian telecom operators under pressure over fierce pricing competition: Moody's," *Sakshi Post*, November 2, 2017; and Leslie D'Monte, "It's the survival of the biggest in India's telecom industry," Livemint, April 7, 2017.

HIGHER INTEREST RATES COULD INCREASE THE SHARE OF CORPORATE BONDS AT RISK OF DEFAULT

After ten years of historically low interest rates thanks to weak investment and unconventional monetary policies, rates now appear to be heading upward—although there is considerable doubt about the speed at which this increase is likely to unfold.[34] In March 2018, the median forecast by participants in the US Federal Open Market Committee was for the target federal funds rate to rise to 2.10 percent in 2018, 2.90 percent in 2019, and 3.40 percent in 2020. However, these median forecasts disguised a wide variety of views—forecasts for 2020 range from 1.5 to 4.5 percent. The Bank of England is also raising interest rates, and the European Central Bank is moving to taper its asset purchases.

Rising interest rates will not affect the ability of most companies to make interest payments, since many bonds offer fixed rates for the duration of the contract. However, it will make refinancing bonds more expensive for companies seeking to issue new bonds. This would lower the interest coverage ratio and put more bonds at risk of default. We simulated the impact that higher interest rates could have on the interest coverage ratio of companies, and modeled increases by 100 basis points and by 200 basis points. We find that in advanced economies, the impact of rising interest rates on companies' ability to service their debt will likely be modest. In developing countries, it could raise the portion of bonds at risk of default even higher.

Brazil and India, for instance, would experience a significant increase in the share of bonds at risk of default if interest rates rise (Exhibit 12). In Brazil, the share of bonds at higher risk of default might increase from 24 percent currently to one-third of total corporate bonds outstanding if interest rates were to rise by 200 basis points. In India, the share could increase to 27 percent from the current level of 18 percent.

In this simulation, China's share of corporate bonds at higher risk of default could rise to 43 percent, or $850 billion, up from $475 billion in 2017. However, the central bank heavily influences interest rates, and presumably authorities would be careful to avoid any large rise in interest rates that could put such a considerable share of the corporate bond sector at risk.[35]

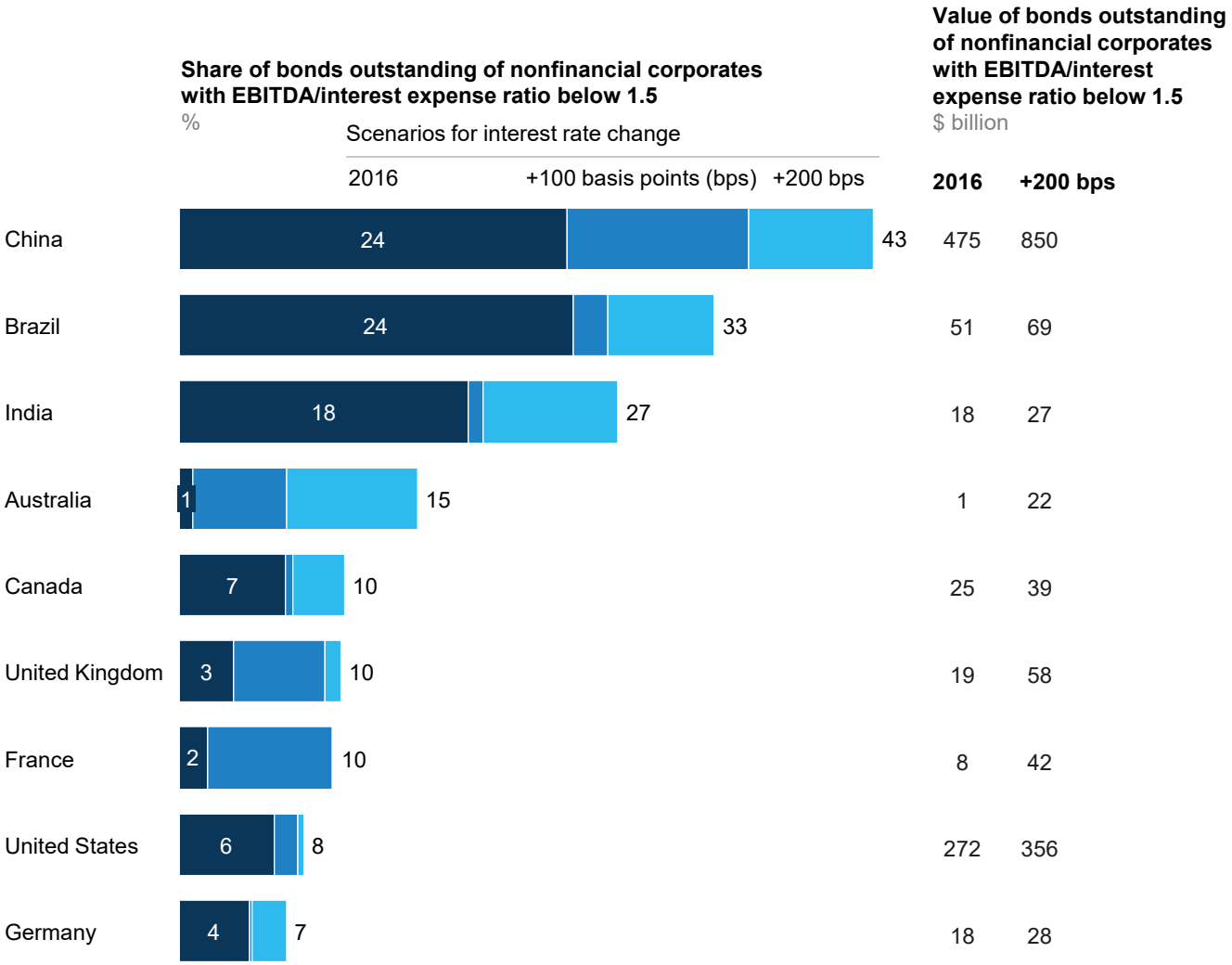
In most advanced economies, the average share of corporate bonds from issuers with interest coverage ratios below 1.5 is expected to stay at or below 10 percent even if rates rise by 200 basis points. Australia is the only exception: its share of bonds at higher risk of default could jump from 1 percent to 15 percent in the case of a 200-basis-point rise. However, this translates into only a $21 billion increase in the value of bonds outstanding at risk, since Australia's corporate bond market is relatively small ($150 billion outstanding in 2016). In France and the United Kingdom, the share of bonds issued by companies with an interest coverage ratio below the 1.5 threshold would increase from 2 percent to 10 percent and from 3 percent to 10 percent, respectively. In Germany, even with a 200-basis-point rise in interest rates, the share of bonds issued by companies with a low interest coverage ratio would still reach only the 7 percent mark; the share would be 8 percent in Japan and the United States.

[34] In early January 2018, yields on the global government bond market spiked after data showed that the Bank of Japan had slowed some long-dated bond purchases, fueling speculation that the Japanese central bank (like the US Federal Reserve and the European Central Bank) was beginning to scale back its economic stimulus. See Eric Platt and Robin Wigglesworth, "US government bond sell-off triggers warnings," *Financial Times*, January 10, 2018.

[35] Sally Chen and Joong Shik Kang, *Credit booms—is China different?* IMF working paper 18/2, January 2018.

Exhibit 12

In China, Brazil, and India, 30 to 40 percent of corporate bonds may be at risk of default if interest rates rise.



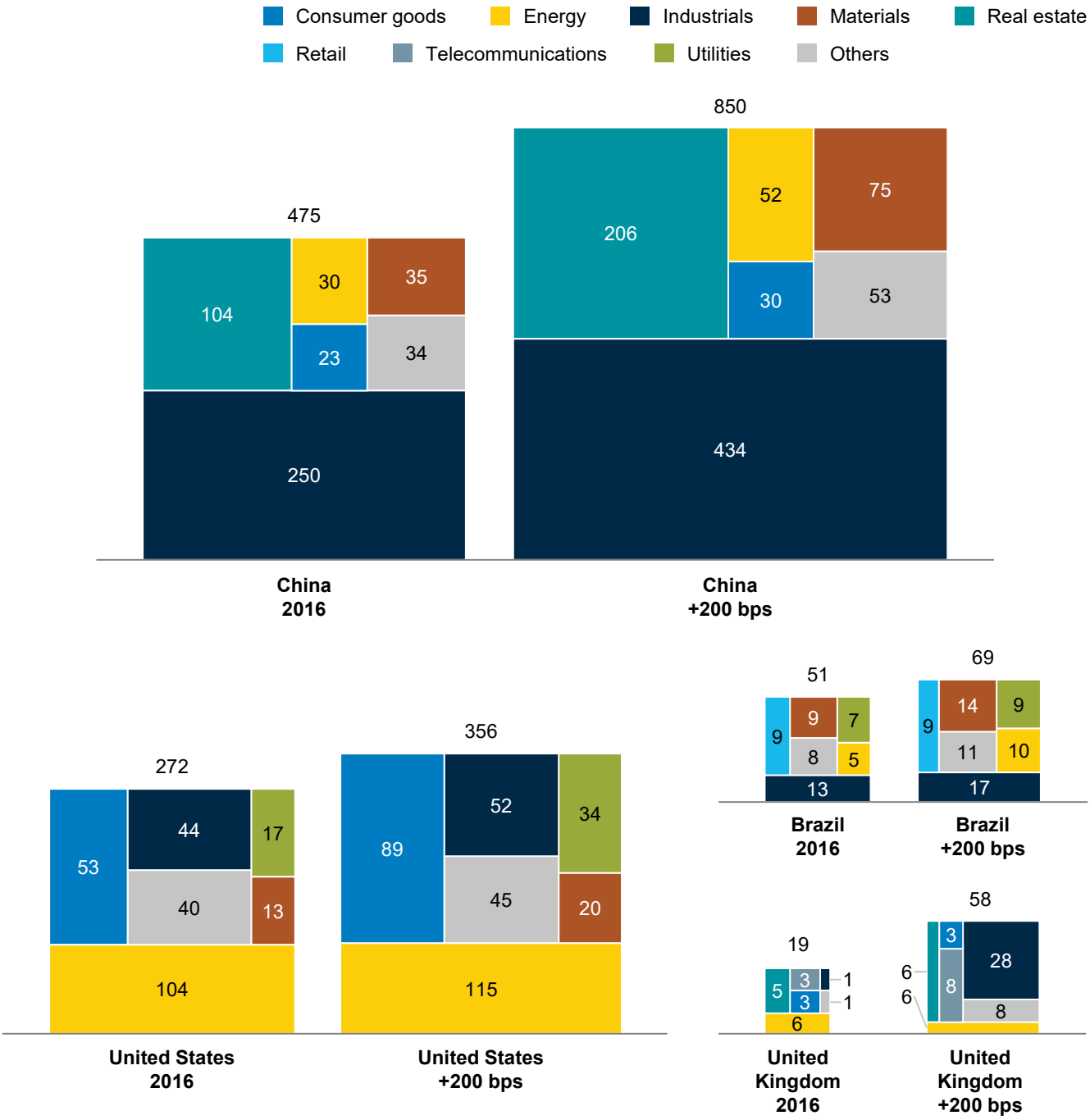
SOURCE: Capital IQ; Dealogic; McKinsey Global Institute analysis

A more nuanced picture emerges when we look at the share of bonds at higher risk of default in specific sectors (Exhibit 13). An increase in interest rates would affect capital-intensive industries the most in our simulation. For instance, in the case of a 200-basis-point rise in rates, the value of corporate bonds at higher risk of default in China's industrial sector would grow from $250 billion currently at risk to $434 billion, and in the real estate sector would climb from $104 billion to $206 billion. In Brazil's industrial sectors, the value of bonds at higher risk of default would increase from $13 billion to $17 billion in our simulation. In contrast, our analysis finds that the US energy sector would experience only a marginal rise in the value of bonds at higher risk of default in this scenario, from $104 billion to $115 billion, suggesting that most issuers' interest coverage ratios are well above 1.5.

Exhibit 13

The sectors most at risk vary by country.

Value of bonds outstanding of nonfinancial corporates with EBITDA/interest expense ratio below 1.5
$ billion



NOTE: Figures may not sum to 100%, because of rounding.

SOURCE: Capital IQ; Dealogic; McKinsey Global Institute analysis

3. NAVIGATING THE RISKS THAT LIE AHEAD

It is uncertain whether the surge in corporate bond markets over the past ten years will continue after the credit cycle turns and interest rates rise. Investors' appetite for corporate bonds may wane if sovereign bond yields rise, or if corporate defaults continue to mount. Corporate defaults are already above the 30-year average, and we should expect more defaults, particularly among speculative-grade issuers and some companies in developing countries.

On the other hand, there is still a great deal of headroom for corporate financing to shift toward bonds and away from loans—a shift that is possible without any increase in overall corporate debt levels. Despite the shift to bond financing over the past ten years by companies in Western Europe, the share of bond financing was still only 17 percent in 2016—half the US share. In China, the share of bond financing in corporate debt was only 11 percent in 2016, one-third of the share in the United States. In other words, if companies in Western Europe and China were to match the appetite of US corporations for bond financing, their markets would double and triple in size, respectively.

Moreover, one insight that emerged from the crisis is that the widely held perception that sovereign bonds offer a safe refuge while corporate bonds are riskier does not always hold. The risk-reward equation is not as clear as in the past, and it may be that, even if sovereign bond issuers offer higher returns as interest rates rise, investors may not shift into sovereign bonds to the same extent as in the past.

In order to navigate this new era, banks, investors, and policy makers must recalibrate their approaches.

BANKS: NEW CUSTOMERS, NEW SKILLS

As large companies move toward raising more funding through bond markets, banks will need to shift their focus toward serving small and medium-sized enterprises (SMEs) and individuals. This will require sharper skills in assessing the risks of these smaller borrowers as well as greater efficiency to overcome the inherently higher costs of making many small loans rather than a few large ones. Improvements in underwriting and credit scoring capabilities will be needed in order to sustain healthy margins, especially given the erosion of margins being observed in retail banking. In order to compete with "platform" companies like Alibaba, Amazon, and Tencent, banks will need to further develop their digital skills and improve their agility.[36]

Robotic process automation and artificial intelligence offer new solutions for both assessing risks and improving cost efficiency.[37] Using robotic process automation, for example, one large bank automated 70 percent of the tasks related to its financial reporting process. The time to generate a quarterly report was cut from 14 days to between six and eight; staff spent time reviewing exceptions and anomalies rather than processing data. Overall costs were reduced by 30 percent. Productivity improvements of this magnitude would offset the inherently higher costs of serving SMEs and retail customers rather than large corporates.

[36] *The phoenix rises: Remaking the bank for an ecosystem world*, McKinsey Global Banking Annual Review 2017, McKinsey & Company Global Banking Practice, October 2017.

[37] Xavier Lhuer, *The next acronym you need to know about: RPA (robotic process automation)*, McKinsey & Company interview, December 2016.

Machine learning and artificial intelligence can also improve the assessment of creditworthiness of potential borrowers by considering a wider range of data on the borrower, by identifying new predictors of future behavior and by improving valuations of collateral. The use of dynamic risk-adjusted pricing and limit setting can help improve scoring as well as sustain healthy margins. McKinsey's experience suggests that digitizing current risk-management approaches can reduce operating costs for risk activities by 20 to 30 percent.[38] Many fintech startups use advanced analytics to improve scoring. One example is Lenddo; its business focuses on developing countries where even members of the middle class often lack credit histories or even bank accounts. The company (and others like it) looks at potential applicants' entire digital footprint to determine their creditworthiness by having individuals download a smartphone app. A machine learning algorithm gathers more than 12,000 variables, including use of social media, internet browsing, and geolocation data, and turns them into a credit score. Lenddo says that five million people have received loans because its system was able to evaluate their creditworthiness. Similar startups include Cignify, Revolution Credit, and Tala. Even traditional credit scoring agencies, the Fair Isaac Corporation being one example, are using nontraditional data sources to improve their assessment of borrowers.

INVESTORS: OPPORTUNITY AND RISKS

Investors have benefited from the strong growth in corporate bond markets over the past ten years, offering a larger asset class to tap in their search for higher yields than sovereign bonds. Their demand for corporate bonds has fueled soaring growth in corporate bond mutual funds and exchange-traded funds (ETFs, or baskets of bonds that trade on equity exchanges as a single stock). The total value of assets under management in these funds had grown to $777 billion in 2017, 3.5 times higher than a decade earlier.[39] That opened the door for retail investors to acquire corporate bonds, providing further momentum to the bull market in corporate bonds. However, the growth of these investment vehicles may also cause unknown dynamics when the corporate bond bull market ends, as retail investors can easily dump bonds quickly through these funds, sending yields soaring.[40]

In the years ahead, investors will need to undertake especially careful due diligence in evaluating corporate borrowers. Our analysis shows that many companies—particularly in developing countries and in some industries in advanced economies—are already vulnerable to default on their corporate bonds, and that this risk will increase if interest rates rise. Financial reporting standards vary widely in developing countries, and for many companies, transparent and timely reporting are relatively new. Corporate governance structures also differ, sometimes with less demand for transparency on financials. The coming years may create many new opportunities for distressed debt investors if corporate defaults continue to rise.

It remains to be seen whether Western European and developing economies will continue migrating toward the bond-heavy structure of the United States. If they do, investors could benefit from increased diversity of investment opportunities in both blue-chip debt and speculative-grade bonds.

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[38] Saptarshi Ganguly, Holger Harreis, Ben Margolis, and Kayvaun Rowshankish, *Digital risk: Transforming risk management for the 2020s*, McKinsey & Company, February 2017.

[39] Corporate bond funds are defined as funds with more than 65 percent of assets in corporate bonds (nonfinancial and financial).

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POLICY MAKERS AND REGULATORS

Growth of corporate bond markets is welcome news for policy makers and regulators concerned with financial stability. Debt capital markets provide an alternative to bank financing for large companies, and they prompt banks to increase lending to SMEs and households. To ensure healthy growth of corporate bond markets, policy makers should consider focusing on several objectives.

Bond markets need to enter the digital age. Despite being worth $11.7 trillion, the market is surprisingly antiquated, with little transparency or efficiency. While equities can be traded at the click of a button, buying and selling corporate bonds often requires a phone call to a trading desk at an investment bank, and there is little transparency on the price the buyer is quoted. This method of trading still accounts for more than 80 percent of volume in the United States. Processes are correspondingly slow: 8 percent of trades in Europe fail to settle in the allotted two days.[41] One solution is moving to electronic trading platforms that enable investors to trade bonds with one another rather than going through a broker. This is not a new idea, and it is how the majority of government bonds in the United States and Europe are already traded. Adoption has been slower in corporate bond markets, but it should be encouraged to improve market efficiency, transparency, and liquidity.

Potential improvements can also be made in the contractual elements of corporate bonds. Simply standardizing contracts is important for increasing transparency and tradability in secondary markets. Even today, more than 40 percent of corporate bonds are not evaluated by credit rating agencies, being sold instead in opaque transactions.

Policy makers must continue to promote transparency in corporate financial reporting so that investors can properly assess the risks of bond issuers. In developing countries, this is particularly important, as reporting standards are often weak and corporate ownership structures can be complicated with cross-shareholdings and related privately owned companies.

Finally, policy makers need to monitor potential systemic risks that stem from corporate bond markets. This is particularly the case when banks end up as the main buyers of corporate bonds. Although Basel III standards and other regulations have reduced banks' appetite for holding bonds, it is important to monitor potential linkages that can cause disruptions in one market to spill over to the other. While the transfer of risk across many investors in corporate bond markets should improve the resilience of the banking system, risks can also be concentrated if a few large institutions dominate the market. As interest rates normalize, some of the recent increases in corporate leverage, particularly in developing economies, could reverse, and policy makers need to be vigilant to ensure that economies are resilient in the face of deleveraging.[42]

[41] "Corporate bond markets need a reboot," *Economist,* April 20, 2017.

[42] Snehal S. Herwadkar, *Corporate leverage in EMEs: Did the global financial crisis change the determinants?* BIS working paper number 681, Bank for International Settlements, December 2017.

For years, bond financing was largely favored only by the largest US corporations. But over the past ten years, companies around the world have joined in, giving corporate bond markets outside of the United States new life. This is a long-awaited development that indicates a welcome diversification of global corporate funding and the potential for more financial stability. But the bull market in bonds has also brought some risks. The fact that corporate debt has grown nearly as much as government debt over the past decade is cause for closer scrutiny of the sustainability of the market, if not concern. Our analysis shows that some borrowers with little capacity for a downturn in their finances have accessed the market; we may see a rise in defaults in the coming years as a result. The question remains whether the corporate bond market will continue to grow deeper and broader as interest rates rise and investors bear the cost of more corporate defaults. There is significant scope for further growth in corporate bond markets outside the United States, but our analysis clearly points to bumps in the road ahead.

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This paper contributes to MGI's mission to help business and policy leaders understand the forces transforming the global economy, identify strategic locations, and prepare for the next wave of growth. As with all MGI research, this work is independent and has not been commissioned or sponsored in any way by any business, government, or other institution. We welcome your comments on the research at **MGI@mckinsey.com**.

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